

17. Why oxidation of trans-2-bromo cyclohexanol gives epoxy derivative and cis-2-bromo cyclohexanol derivative yields cyclohexanone-derivative?
18. (a) Discuss possible mechanism involved in hydrolysis of esters. (5)
- (b) Explain electrophilic substitution accompanied by double bond shift with suitable examples. (5)
19. (a) With the support of suitable examples explain mechanism of (i) Gattermann-Koch reaction (ii) Reimer-Tiemann reaction. (5)
- (b) Explain the formation and detection of arylne ion intermediate in aromatic electrophilic substitution. (5)
20. Explain the kinetic methods of determining the mechanism of organic reaction with suitable examples.

APRIL/MAY 2023

GCH11/DCH11 — ORGANIC CHEMISTRY - I

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Draw the structural formulae of the (S)-2-Chloroheptane in the Fischer form.
2. How to convert the sawhorse projection to Fisher projection?
3. Draw the stable isomer of 1,4-dimethyl cyclohexane. Why it is a stable conformer?
4. What is the stable conformation of 9-methyl decalin?
5. Why 1-iodobicyclo [2,2,2] octane is inert to hydroxide ion?
6. Give an example for  $SE^i$  reaction.
7. What is meant by o/p ratio? Give one importance of o/p ratio.



8. Give an example for Vilsmeier-Hack formylation. What is the role of  $\text{POCl}_3$  in this reaction?
9. How to express kinetic deuterium isotopic effect?
10. Give an example for stereochemical evidence in the determination of mechanism.

SECTION B — ( $5 \times 5 = 25$  marks)

Answer ALL questions.

11. (a) Discuss the stereochemistry of helical structures and spirocompounds.

Or

- (b) Explain the importance of erythro and threo nomenclature with suitable examples.

12. (a) Discuss the conformational features of different geometrical forms of 1,2 and 1,4-dimethyl cyclohexanes.

Or

- (b) Explain the stereochemistry and conformation of cis and trans-decalin.

13. (a) What is neighbouring group participation? Account for the formation of  $\text{Et}_2\text{NCH}(\text{C}_2\text{H}_5)\text{CH}_2\text{OH}$  from the alkaline hydrolysis of  $\text{Et}_2\text{NCH}_2\text{CHClCH}_2\text{CH}_3$

- (b) How to distinguish between  $\text{SE}^2$  from  $\text{SE}^1$  reaction?

14. (a) Explain the following reactions with plausible mechanism and example (i) Ziegler alkylation, (ii) Chichibabin reaction.

Or

- (b) Discuss different methods of generating benzyne intermediate.

15. (a) Write briefly about the isotopic effects in an organic reaction.

Or

- (b) Write the Hammett and Taft equations. Explain the parameters in these equations.

SECTION C — ( $3 \times 10 = 30$  marks)

Answer any THREE questions.

16. (a) Differentiate homotopic, enantiotopic and diastereotopic with faces example for each type. (6)
- (b) What is stereo selective synthesis? Explain with suitable examples. (4)